

# An Analysis of the Red Creek Watershed

## Environmental Science Capstone Class of 2011

### About Red Creek

Red Creek is considered a 303(d) stream, meaning it is severely impaired so that minimum water quality standards are not met. Subsequently, further studying and monitoring of the stream are needed to assess what may be contributing to the streams impairment so that water quality may be improved.

RIT Capstone Red Creek Sampling Points, 2011

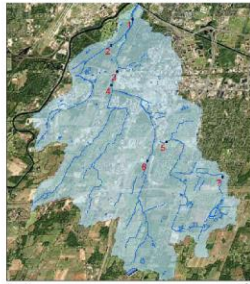


Fig. 1

To assess stream health, 7 sample points were selected (fig. 1).  
 •Site 1 is the Genesee Valley Park and where all the water drains prior to meeting up with the Genesee River in the Erie Canal  
 •Site 2 is located on Crittenden Rd in a woody residential area  
 •Site 3 is located along Brighton-Henrietta Townline Rd  
 •Site 4 is located behind the newly constructed apartment complex, the Province on John St.  
 •Site 5 is located within Veteran's Memorial Park  
 •Site 6 is located along Lehigh Station Rd just after a wetland area  
 •Site 7 is located on Tomahawk Trail in a residential area and is the sole site representing the unsewered portion of the watershed in the analysis

### Methods

- Samples were collected in the morning on March 29, April 5, April 12, and April 19 of 2011.
- pH, conductivity, and temperature were measured
- Water samples were sent to Monroe County for analysis
  - Analytes run include NH<sub>3</sub>, Nox, TKN, TP, OP, chloride, and E. Coli
- GIS analysis was used to identify sources for nutrient inputs, erosion, sedimentation, runoff, and change in land use land cover time
- Stream banks were analyzed for riparian cover and erosion within the stream

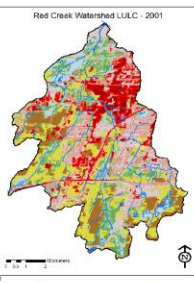


Fig. 2

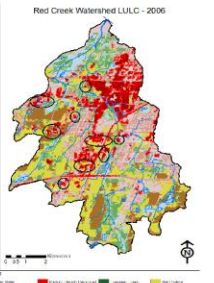


Fig. 3

Fig. 2 and 3 show the subtle changes in land use land cover from 2001 to 2006, which are circled on the 2006 map (fig. 3). The Red Creek watershed is becoming increasingly urban, contributing to the deteriorated water quality observed in Red Creek.

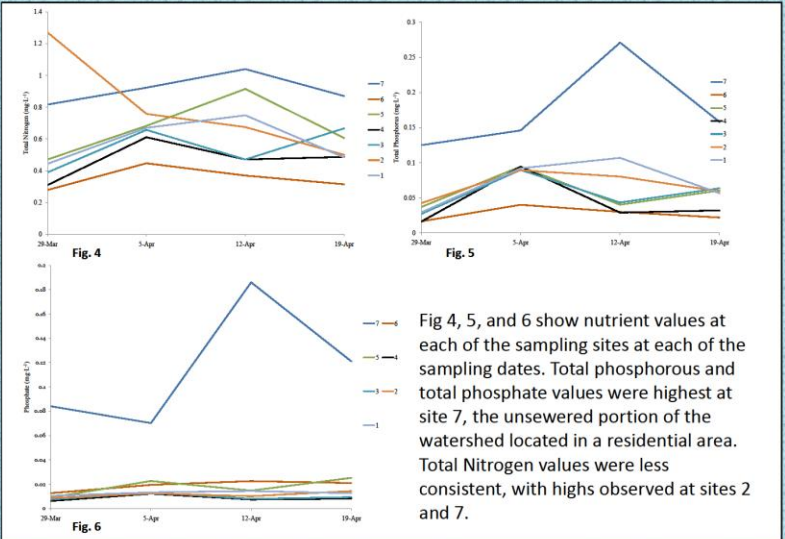


Fig. 4

Fig. 5

Fig. 6

Fig 4, 5, and 6 show nutrient values at each of the sampling sites at each of the sampling dates. Total phosphorous and total phosphate values were highest at site 7, the unsewered portion of the watershed located in a residential area. Total Nitrogen values were less consistent, with highs observed at sites 2 and 7.

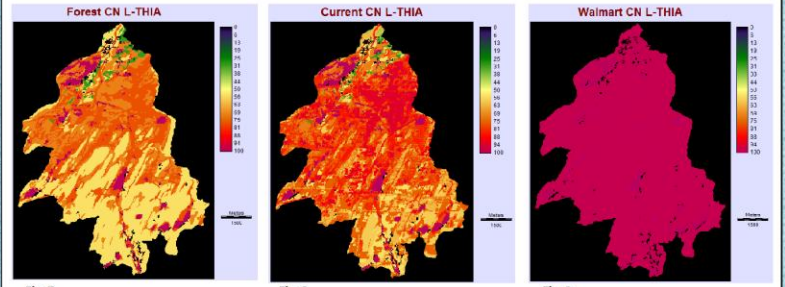


Fig. 7

Fig. 8

Fig. 9

Fig. 7, 8, 9 display how the percentage of runoff values change based on the land cover in the watershed. The forested L-THIA model represents pre-settlement conditions where pervious surfaces would be the greatest and runoff the lowest. The current L-THIA model shows how the impervious surfaces and change in land cover have increased runoff entering the stream today. The Walmart L-THIA model shows what runoff conditions in the watershed would look like if the whole watershed were to be covered by impervious surfaces.

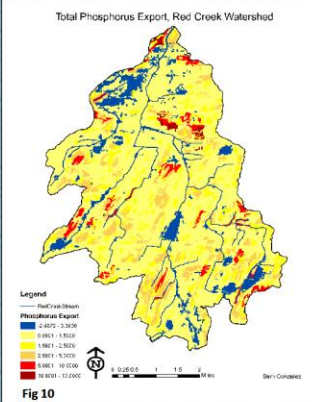


Fig 10

Fig. 10 displays areas where phosphorous export may be of concern within the watershed in kg/hectare for the phosphorous values. These areas may need further monitoring to determine if they are sources for excess phosphorous within Red Creek. Some of the areas suspected of high phosphorous export are near sampling points where high levels of phosphorous and phosphate were observed.

This project was done by the Environmental Science Capstone class of 2011 in conjunction with Monroe County Pure Waters